**Abstract**

Putrescine (5, 10 and 20 mM), spermidine (0.5, 1 and 2 mM) and aminoethoxyvinylglycine (AVG; 0.32, 0.64 and 1.28 mM) were applied to peach trees (*Prunus persica* L. Batsch cv Stark Red Gold) under open field conditions. Treatments were performed 28 (polyamines; PAs) and 21 or 7 (AVG) days before harvest at 115 dAFB. Both PAs and AVG reduced ethylene production of fruit, delayed loss of firmness, retained titratable acidity, and prevented the increase in dry matter (DM) and soluble solids concentration (SSC). Fruit drop was consistently reduced by AVG at both application times, and by the highest spermidine concentration. Endogenous PA levels in treated fruit were transiently affected (7 days after treatment), but returned to control values at harvest in both mesocarp and epicarp tissues. Northern analysis of ethylene biosynthetic genes, 1-aminocyclopropane-1-carboxylate synthase (ACS) and 1-aminocyclopropane-1-carboxylate oxidase (ACO), and of those involved in PA biosynthesis, arginine decarboxylase (ADC), ornithine decarboxylase (ODC) and S-adenosylmethionine decarboxylase (SAMDC), was performed in mesocarp tissue at harvest. AVG and putrescine reduced the accumulation of ACO and SAMDC message, putrescine also influenced ACS transcript levels, while spermidine did not affect any of these genes. Results are discussed on the basis of the reduction by PAs and AVG of ethylene production, and confirm the capacity of these naturally occurring substances to modulate fruit ripening.